

CHAPTER 3

METHODOLOGY

3.0 Introduction

This study is an exploratory study designed to investigate the problem of discriminating between individual's contributions and efforts in the assessment of group project. It also attempted to formulate a rewarding scheme for an individual's contribution in a group project. In this chapter, sample, instruments, procedure and administration, and data collection are discussed.

3.1 The Sample

The subjects for this study were Pre-University students from a private college in Klang Valley. There were 16 students chosen at random from three Mathematics classes for this study. They participated in the study during the whole semester. The students consisted of seven boys and nine girls. The students were divided into four groups. Each group comprised four students of mixed abilities. These groups of students had just completed their secondary level education and had sat for *Sijil Pelajaran Malaysia* (SPM) examination that is equivalent to O'level. The selected students had not been exposed to cooperative and collaborative group-work in learning

Mathematics and presentation of the project work in Mathematics. However, in this Pre-University programme they are frequently subjected to group learning and presentation in Mathematics class.

As an assessment of the works produced, the students were required to complete a Mathematics project (Appendix 4). They were given one month to carry out this project and were expected to complete a written report and do a 20 minutes presentation in the class at the end of the project.

3.2 Description of Instruments

The instruments used in this study were adapted from Lopez-Real and Chan (1999) as shown in Appendices 1a, 1b, 3a, 3b and 3c. Two different instruments were used in this study. The First instrument was used to assess the process of preparing the project and the oral presentation of the project. It was termed as process assessment. Peer assessment was used to assess the contributions of individual within the group during the process of doing the project and the oral presentation of other groups. Students were required to grade the peers by filling out the assessment form. (Appendices 1a and 1b). The process of the project included the distribution of different aspects of the project among themselves at the early stage (Examples: responsibility for literature search, collection of data, writing up reports and others). Therefore, students' involvement and contribution to this process would be measured in generic terms rather than the portion of the product that might have directly associated with them.

In the assessment form of the process assessment, the following generic process criteria were classified under the three main categories of initiative, commitment and conducive group-behaviour with two sub-criteria for each category.

Initiative

- (i) Generating ideas for the activities and method of solution.
- (ii) Finding ideas from other sources.

Commitment

- (i) Doing a fair share of work.
- (ii) Meeting deadlines, attending meetings and being punctual.

Conducive Group Behaviour

- (i) Allowing other members to have a fair chance to contribute.
- (ii) Responding constructively to each others contribution.

In the assessment of Oral Presentation, the criteria were classified into two main categories of communication skills and content with two sub-criteria for each category.

Communication Skills

- (i) Clarity of explanation.
- (ii) Quality of visual aids.

Content

- (i) Variety of activities.
- (ii) Motivation quality of the activities.

The second instrument was the evaluation questionnaires. These questionnaires were used to find out the perceptions of students towards the use of peer assessment in the process assessment, assessment of oral presentation and the perceptions of the students towards the new assessment system, that is the incorporation of peer assessment in the group project. Students were required to fill out the questionnaires after the marked project was returned to them (Appendices 3a,3b and 3c).

The perceptions and evaluations of students toward the use of peer assessment in the oral presentation and process of the group project were based on the responses to “strongly agree”, “agree”, “disagree” and “strongly disagree” with respect to various statements. The statements were classified under four main headings namely purpose, criteria implementation and achievement of the purpose. The perceptions and evaluation of students toward the new assessment system were based on the same selection of Likert scale responses. The statements were based on three main categories namely structure, weighting and overall perception.

3.3 Procedure

The procedure of this study involved three parts: the implementation of the assessment structure, evaluation by questionnaires and open-ended interviews.

3.3.1 Implementation of Assessment Structure

The assessment structure included both the process and product assessment. It comprised three components:

- (i) The content or the product of the project. It would be assessed solely by the teacher.
- (ii) The oral presentation of the project. It would be assessed by the teacher and the students from other groups (across group peer assessment).
- (iii) The contributions by each individual in the group to the process of group project or group-work. It would be assessed solely by students in the group (within group peer assessment).

The relative weighting of the components of (i) to (iii) are shown in Appendix

2. The students were given the opportunity to assess the product of the other groups' work through the oral presentation and the teacher assessed the product by grading the written report. During the oral presentation, the teacher only assessed the communication skills and not the content category. This was the marks allocated by students and teacher that accounts for the 2:1 ratio in the weighting (Appendix 2).

In the oral presentation, each group was given 20 minutes to present their project to the rest of the class. There were four groups in the class and each group consisted of four members. Hence, the 4-students group would be assessed by the remaining twelve students.

The assessment structure and criteria (Appendix 1b) for the oral presentations and group-work assessment were explained to students. The purpose was for the students to have time to familiarise themselves with the criteria, to make sure they

agree on the interpretation, to discuss together any difficulties or lack of clarity that they could identify and to discuss and suggest any changes with the teacher.

Each student was asked to assess the work of other groups by filling in an assessment form (Appendix 1b) during the oral presentation. The students would not assess their own groups' work. By allocating a simple Likert-scale of 5,4,3,2 and 1 to the ratings of excellent, very good, good fair and weak respectively, a percentage of the total possible marks were obtained for each group. The students' marks and teacher's marks were then converted using a ratio 2:1 weighting for a total mark of 15.

For the process assessment (within group peer assessment), the students were asked to complete another assessment form (Appendix 1a). The same rating system was used as the oral presentation. The calculation of marks for individual student would be based on the percentage of total possible marks for any given students and converted this to a mark out of 25 for the final individual assessment.

3.3.2 Evaluations and Perceptions of Students Toward Peer Assessment

An evaluation based on the group feedback session was carried out after the teacher had returned the marked project assignment. The purpose was for students to ask questions or provide feedback on the assessment. In this evaluation session, each student was asked to answer three feedback questionnaires: the assessment on oral presentation, group-work and the new assessment system as a whole (Appendix 3a, 3b, 3c).

3.3.3 Interviews

Individual interviews were conducted with six students on voluntarily basis in order to achieve better understanding of students' acceptance or reservation about this system, to gain insight into the ways students approaching the rating tasks and to identify ways to improve the assessment for future implementation. Open-ended interview method was used. The first part of each interview focused on aspects of the assessment that the students disagreed or felt uncertain about and the impact of the assessment on their learning. The second part of the questions concentrated on the descriptors/rating and rating scales. Thirdly, students were invited to suggest improvement for various part of the assessment.

3.4 Data Collection

The administration of the assessment structure, evaluation and interviews were conducted by the researcher herself whom is the teacher in the programme. All testing instruments were administered in the natural environment and setting. The peer assessment forms (Appendices 1a, 1b) completed by students were kept strictly confidential. The interview sessions were carried out individually outside the classroom.

3.5 Pilot Study

The instruments on the assessment forms and evaluation questionnaires were pilot tested with a sample of 20 students in a pre-university Mathematics class with

agree on the interpretation, to discuss together any difficulties or lack of clarity that they could identify and to discuss and suggest any changes with the teacher.

Each student was asked to assess the work of other groups by filling in an assessment form (Appendix 1b) during the oral presentation. The students would not assess their own groups' work. By allocating a simple Likert-scale of 5,4,3,2 and 1 to the ratings of excellent, very good, good fair and weak respectively, a percentage of the total possible marks were obtained for each group. The students' marks and teacher's marks were then converted using a ratio 2:1 weighting for a total mark of 15.

For the process assessment (within group peer assessment), the students were asked to complete another assessment form (Appendix 1a). The same rating system was used as the oral presentation. The calculation of marks for individual student would be based on the percentage of total possible marks for any given students and converted this to a mark out of 25 for the final individual assessment.

3.3.2 Evaluations and Perceptions of Students Toward Peer Assessment

An evaluation based on the group feedback session was carried out after the teacher had returned the marked project assignment. The purpose was for students to ask questions or provide feedback on the assessment. In this evaluation session, each student was asked to answer three feedback questionnaires: the assessment on oral presentation, group-work and the new assessment system as a whole (Appendix 3a, 3b, 3c).

3.3.3 Interviews

Individual interviews were conducted with six students on voluntarily basis in order to achieve better understanding of students' acceptance or reservation about this system, to gain insight into the ways students approaching the rating tasks and to identify ways to improve the assessment for future implementation. Open-ended interview method was used. The first part of each interview focused on aspects of the assessment that the students disagreed or felt uncertain about and the impact of the assessment on their learning. The second part of the questions concentrated on the descriptors/rating and rating scales. Thirdly, students were invited to suggest improvement for various part of the assessment.

3.4 Data Collection

The administration of the assessment structure, evaluation and interviews were conducted by the researcher herself whom is the teacher in the programme. All testing instruments were administered in the natural environment and setting. The peer assessment forms (Appendices 1a, 1b) completed by students were kept strictly confidential. The interview sessions were carried out individually outside the classroom.

3.5 Pilot Study

The instruments on the assessment forms and evaluation questionnaires were pilot tested with a sample of 20 students in a pre-university Mathematics class with

3.3.3 Interviews

Individual interviews were conducted with six students on voluntarily basis in order to achieve better understanding of students' acceptance or reservation about this system, to gain insight into the ways students approaching the rating tasks and to identify ways to improve the assessment for future implementation. Open-ended interview method was used. The first part of each interview focused on aspects of the assessment that the students disagreed or felt uncertain about and the impact of the assessment on their learning. The second part of the questions concentrated on the descriptors/rating and rating scales. Thirdly, students were invited to suggest improvement for various part of the assessment.

3.4 Data Collection

The administration of the assessment structure, evaluation and interviews were conducted by the researcher herself whom is the teacher in the programme. All testing instruments were administered in the natural environment and setting. The peer assessment forms (Appendices 1a, 1b) completed by students were kept strictly confidential. The interview sessions were carried out individually outside the classroom.

3.5 Pilot Study

The instruments on the assessment forms and evaluation questionnaires were pilot tested with a sample of 20 students in a pre-university Mathematics class with

similar characteristics of the final sample. The students were distributed in a group of four. They were given a Mathematics project to complete in a stipulated time. After the completion of the project, they presented the product of the project in the class. Each group was given 20 minutes to present. Peer assessment forms were given out for students to do the across-group assessment during the presentation (Appendix 1b). The peer assessment forms (Appendix 1a) were given out for students to do the within-group assessment on the process of the project. This was done in the normal classroom setting where students could discuss among themselves. For the evaluation, the three questionnaires (Appendices 3a,3b and 3c) were tested.

The instruments were pilot tested to ensure clarity of the criteria in both the assessment forms and the evaluation questionnaires. From the pilot study, the students indicated that they were clear and comfortable with the criteria listed in the instruments. In addition, the researcher had made the following changes in the administration of the instruments:

- (i) The assessment form (part I and part II) should be done in confidential and students should not be allowed to discuss. This could eliminate the prior arrangement and agreement of grading other members in the group and collaboration among students in grading other groups. This was in accordance to Rafiq and Fullerton (1996) that the student peer marking should be carried out in a classroom situation under exam conditions to impress upon the student the seriousness of the process and therefore the importance of confidentiality and discourage mark-fixing cartels.

- (ii) The process of the assessment and each criteria used should be explained clearly to students prior to the start of the project.
- (iii) For the evaluation questionnaires, the opinion on the category of “undecided” was omitted. It was found that students would tend to choose this category without serious consideration.